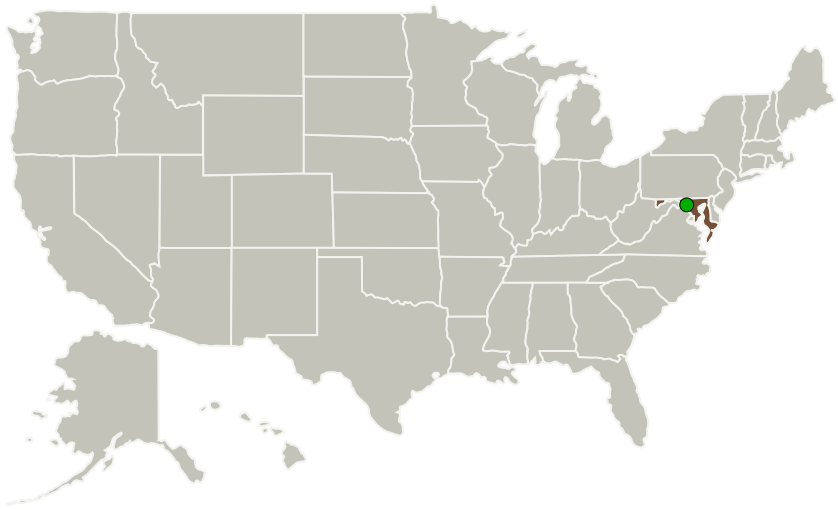
Integrated Spatial Filter Array, Phase II

Completed Technology Project (2010 - 2013)

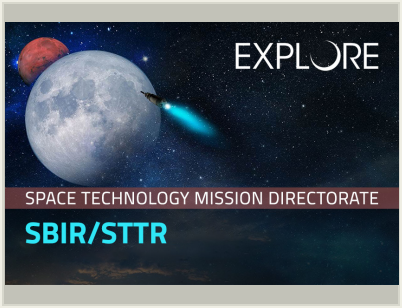
Project Introduction

To address the NASA Earth Science Division need for spatial filter arrays for amplitude and wavefront control, Luminit proposes to develop a novel Integrated Spatial Filter Array (iSFA) comprising integrated waveguides mapped with a pair of commercial lenslet arrays. Thousands of precisely spaced waveguides can be mass-produced with state-of-the-art photonic fabrication technology, which eliminates the tedious and error-prone alignment of up to a 1000 individual optical fibers in legacy fiber bundle SFA. The integrated waveguides are inherently polarization preserving. In Phase I, we designed and fabricated a 16-waveguide iSFA and demonstrated 22 dB polarization extinction ratio and superior coupling efficiency and uniformity over legacy fiber bundle SFA. In Phase II, we will tailor waveguide array parameters for optimum coupling with commercial lenslet arrays and fabricate a fully functioning prototype iSFA with 1,000 buried single-mode waveguide channels operating in a broad wavelength range in the 400-1,000 nm visible band. The iSFA will benefit NASA's Terrestrial Planet Finder mission for detection of earth-like planets, climates, habitability and life beyond our solar system.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Goddard Space Flight Center(GSFC)	Supporting Organization	NASA Center	Greenbelt, Maryland



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Primary U.S. Work Locations
Maryland

Project Transitions

March 2010: Project Start

June 2013: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/139131)*

Project Management

Program Director:

Jason L Kessler

Program Manager:

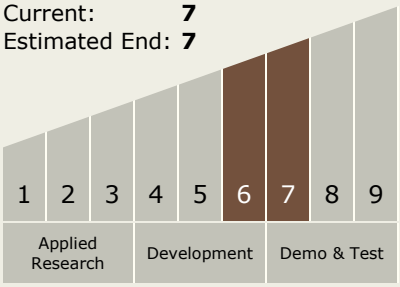
Carlos Torrez

Principal Investigator:

Jun Ai

Technology Maturity (TRL)

Start: **6**
Current: **7**
Estimated End: **7**



Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.1 Detectors and Focal Planes

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System